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REGISTRYFILE Project Misc. OC-3537

30 NOV 64

MEMORANDUM FOR: Deputy Director for Support

SUBJECT : Project Amendment; Request for Approval

REFERENCE : DDCI Memorandum, Approval of Research  
and Development Activities dated  
23 December 1963

25X1A5a1 1. The Special Programs Staff of the Office of Communications has a contract with [REDACTED] for the development of a Contour Signal Plotter. This contract was initiated in FY-64. At that time the company had a substantial investment in the feasibility phase of the project and wished to retain proprietary rights to the design. In view of this, the Office of Logistics negotiated a cost sharing contract placing the governments share at \$46,811 which would be 65.7% of the estimated costs.

2. In July 1964, additional funding was requested by the company due to underestimation of the work involved and loss of key engineering personnel. Company management feeling somewhat responsible for the situation offered to retroactively reduce the government's share of costs to 50%. A contract amendment was written to increase contract funds by \$33,627 making a new total of \$80,438. During the course of this latter work, it became apparent that a major design change, made possible by availability of new components, would greatly enhance the versatility and reliability of the finished product. Technical agreement was reached and the design commenced. However, shortly thereafter, a new cost analysis showed that further funding would be required to complete fabrication of the deliverable prototype equipment. The company estimated this cost to be \$49,193 and in a requested contract amendment stated that they were no longer in a financial position to continue sharing costs. A government audit confirmed their position.

3. Office of Communications engineers have reviewed the technical aspects of the requested amendment and find it to be acceptable. Availability of this machine, which is nearing successful completion, is expected to improve the quality of the analysis product and reduce the time required to visually derive intelligence from complex signal wave forms. A description of the development project and its objectives is attached.

4. Since the cost of the additional work required will result in a total project authorization during the current fiscal year of \$81,820,

approval for///

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approval for the additional funding is requested.

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Attachment;  
Project Description

APPROVED:

/s/ L. K. White

3 DEC 1964

L. K. White

Date

Deputy Director for Support

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✓ - DD/S

Classified Subject

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OFFICE OF COMMUNICATIONS

RESEARCH & DEVELOPMENT  
PROJECT APPROVAL

PROJECT:

Contour Signal Plotter

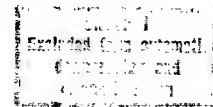
I. IDENTIFICATION:

The Contour Signal Plotter is an audio spectrum analyzer and display unit designed to produce a graphic presentation of time, frequency and amplitude components of a signal for visual analysis. It is unique in that the graph provides an accurate measurement of signal amplitude levels depicted by contour lines in the same manner as a topographical map displays altitude. Development of this equipment is being conducted under the supervision of the engineers of the Special Programs Staff. The cost is included in the Office of Communications financial plan for FY-64 at the \$50,000 level. An Agency equipment designation has not been assigned.

II. OBJECTIVES:

Conventional audio spectrum analyzers produce a graph of complex signal frequency and amplitude component changes with time; however, amplitude differences are quite inaccurately conveyed via the gray scale of the storage medium. It is the purpose of this project to develop a technique for generating and printing the amplitude contour lines and produce an instrument for general use in the Signal Analysis Laboratory. While enhancing the display of amplitude with contour lines, overall improvement of other display characteristics will be included.

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Contour Signal Plotter

Delivery of a useable prototype model of the Contour Signal Plotter is planned under this phase of the project. The intended contractor has already proven feasibility of such an instrument under a company-sponsored program.

III. BACKGROUND:

Present visual analysis of graphic spectrum displays is frustrated by the lack of accurate signal amplitude characteristics. The analyst attempts to discern signal amplitude changes by eye through interpretation of the gray scale of the recording paper. Small changes in amplitude which could carry clues for deriving information from a signal picture might well be lost. An engineering investigation determined that there was a small commercial effort toward development of techniques and equipment which might greatly improve the spectral display. The addition of signal level contour lines in essence added an accurate third dimension to the signal plot.

IV. TECHNICAL SPECIFICATIONS:

The Contour Signal Plotter will produce a plot of signal frequency and amplitude characteristics and their changes with time for rigorous visual analysis. Frequency coverage will be from 100 cycles to 20 kilocycles with either a logarithmic or linear frequency presentation. A dynamic range of 42 decibels will be displayed by seven contour lines. Provision will be made for controlling the

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number and location of the contour lines. Control of the frequency band to be displayed within the 20 kilocycle range will also be provided. Several other significant improvements over present day equipments will be included.

More detailed specifications are available if further information is required.

V. CONTRACTOR AND FINANCIAL ARRANGEMENTS:

As mentioned in paragraph II, the contractor has breadboarded the equipment and proven the feasibility of machine design. Also, he has indicated a willingness to share the costs of continuing development.

VI. COORDINATION:

The general design and operating characteristics of the Contour Signal Plotter have been discussed with appropriate elements of DD/S&T/OEL and NSA.

VII. SECURITY:

It will not be necessary to make the contractor knowledgeable of the specific analysis operations expected to be accomplished with the Contour Signal Plotter. The equipment and technical reports will be UNCLASSIFIED; however, Agency association with the contract will be classified CONFIDENTIAL.